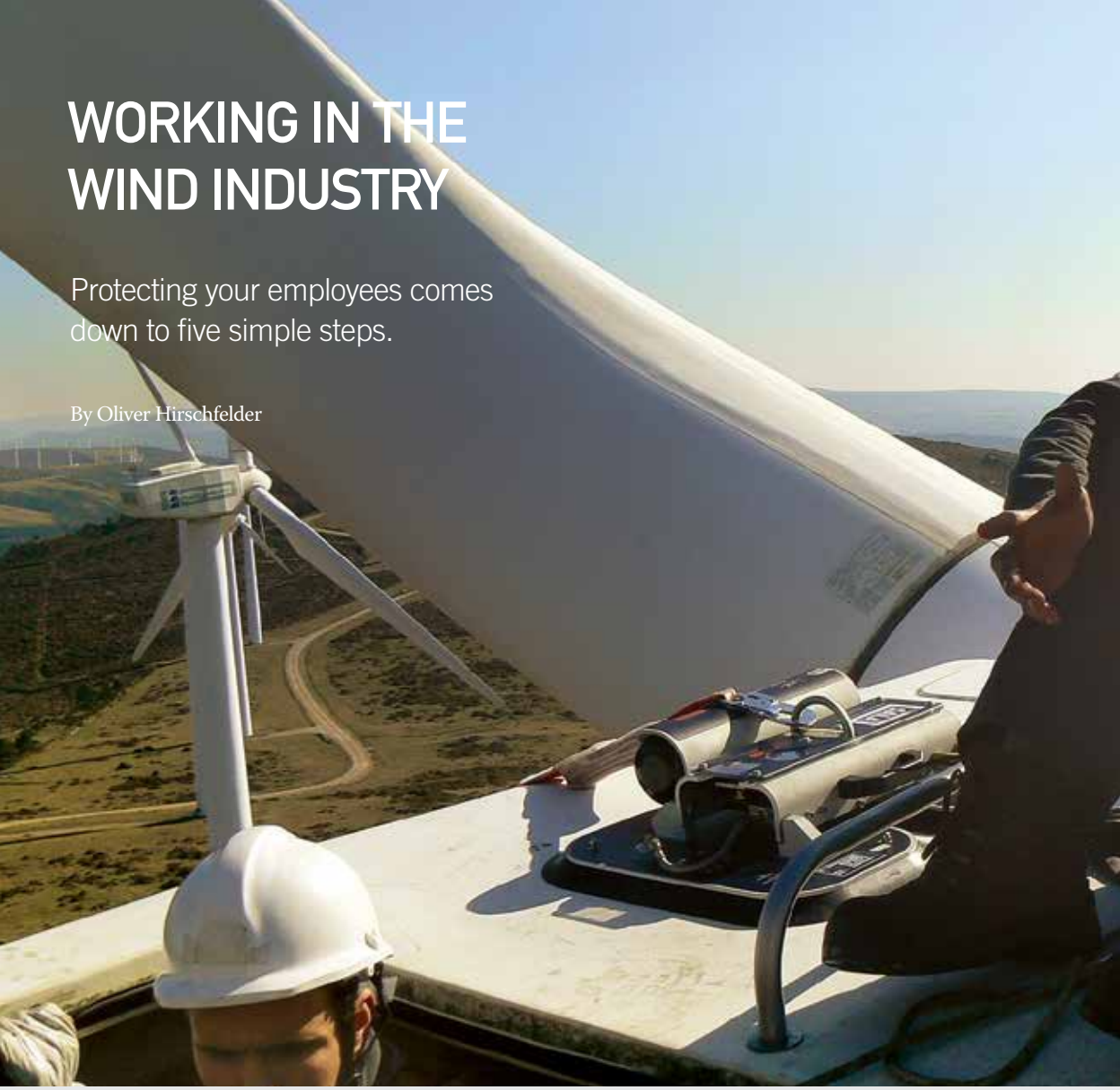
WORKING IN THE WIND INDUSTRY

Protecting your employees comes down to five simple steps.

By Oliver Hirschfelder



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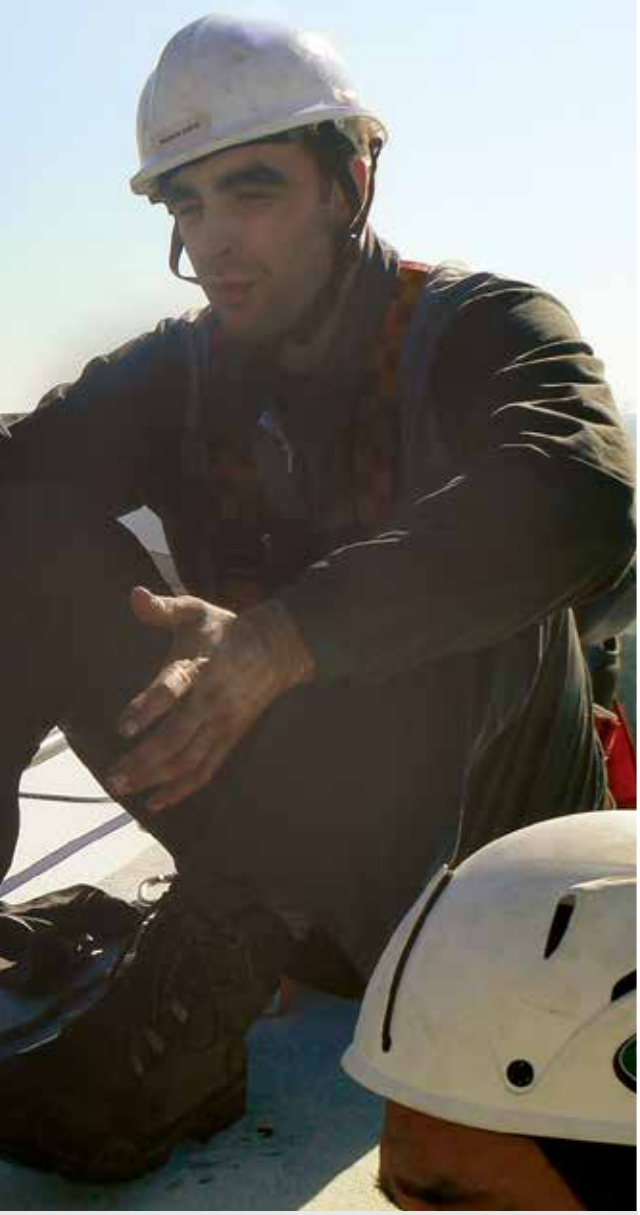
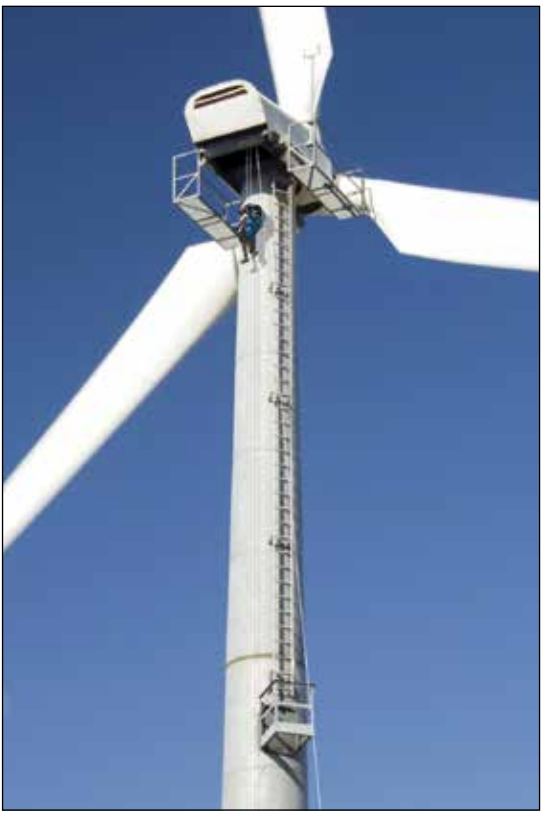
WIND POWER IS ONE OF THE FASTEST growing sectors of the energy industry in the world. The U.S. alone has added over 35 percent of all new generating capacity in the past five years, second only to natural gas, and more than nuclear energy and coal combined, according to the American Wind Energy Association.

Some of the tallest wind turbine towers are several hundred feet high, which makes their installation and maintenance no easy task. Every day, workers encounter a number of dangerous areas associated with the high-risk turbine environments, including working at extreme heights.

Your responsibility to prevent an at-height accident on the wind turbine job site starts on the ground. Ensuring worker safety and health on all wind job sites should be your top priority, which is why developing a well-defined, detailed fall protection plan is critical.

Don't let the combination of federal OSHA regulations, national consensus ANSI standards and variable job site requirements overwhelm you as you begin to construct a formal plan. Follow these five simple steps to maximize your employees' safety at height.





ANALYZE THE WORK ZONE

Before any work is done, it's crucial to perform a hazard analysis to identify areas of high risk. Remember that hazards will vary from job site to job site, even from one wind farm to the next. Consider your specific environment, the height(s) at which work is performed and the number of employees using the area.

Even though height safety is an unavoidable component of wind farm construction, tower erection exposes workers to slightly different hazards than turbine maintenance. Maintenance work may include inspecting the large turbine blades or repairing electrical control units in the nacelle at the top of the turbine. Additionally, not all turbines are installed on flat, dry land. Offshore wind farm construction in the ocean presents a whole new set of challenges.

Accidental falls are preventable if you take the time to carefully assess the hazards unique to your work environment. ANSI offers a hierarchy of fall protection standards that outline the preferred methods to eliminate or control fall hazards. The methods listed below are in decreasing order of preference.

- Elimination or substitution — Remove the hazard or substitute the hazardous work practices for an alternate process or procedure.
- Passive fall protection — Isolate or separate the hazard or hazardous work practices from employees, such as through the use of guard rails.
- Fall restraint — Secure the worker to an anchorage using a lanyard short enough to prevent the worker from reaching a hazard.
- Fall arrest – Use a system to stop or arrest a fall already in progress.
- Administrative controls — Implement practices or procedures, such as safety monitors or signs, to warn workers when approaching a potential fall hazard.

Think of ANSI standards and OSHA regulations as resources, rather than restrictions — they provide information on what types of fall protection equipment are acceptable and preferable for certain applications.

PROVIDE THE BEST JOB-SPECIFIC EQUIPMENT

Wind turbine workers are inevitably exposed to falls of six feet or more, so fall protection equipment is not just recommended, but mandated by OSHA. Your job is to supply employees with equipment suited to their needs. If workers are not using the correct fall protection gear, their safety is compromised.

As you explore fall protection equipment options, use the basic ABCDs of fall protection as a guide:

- Anchorage — The secure point of attachment for the fall arrest system. The anchorage structure to which the connector is attached must be capable of supporting a load of 5,000 pounds or meet OSHA's criteria for a 2-to-1 safety factor.
- Body support — A full body harness provides a connection point on the worker for the personal fall arrest system and distributes fall forces over the upper thighs, pelvis, chest and shoulders.
- Connectors — Devices used to connect the worker's fully body harness to the anchorage point or system, such as a shock absorbing lanyard or self-retracting lifeline.
- Descent/rescue — Descent and rescue devices are an essential component of any fall protection program to retrieve or lower a fallen worker to the ground.

During wind turbine construction and maintenance, different stages typically require different equipment. For example, during tower erection the main fall protection system is often a ladder outfitted with either a vertical fall arrest system or a self retracting lifeline. Crews installing the tower or conducting maintenance work usually wear fall arrest equipment all day. For this reason, it's important to choose lightweight harnesses that pair comfort with durability and can handle extended wear. The right harnesses should also have multiple anchor points that will last through long days on the job.

User-friendly fall protection gear that feels good and fits right leads to optimum comfort, safety and productivity for workers.

TRAIN YOUR EMPLOYEES

Training is vital for all at-height workers. Without adequate training, they may not realize the potentially severe consequences of a fall, including serious injury and death. Not everyone may know how to use the safety equipment correctly. Some may simply be too embarrassed to ask. It's imperative that you provide workers with the proper fall protection equipment paired with comprehensive training programs.

Training must cover every phase of turbine construction, including installation and regular upkeep. It should not be a general overview, but an in-depth session about regulations, potential hazards and proper equipment use for your particular job site.

There are a variety of ways to provide the training your workers need, but the most effective programs involve

an equal amount of classroom and hands-on practical instruction. By providing training opportunities that replicate actual work conditions, employees can easily apply what they've learned to real situations. For example, if you're discussing a harness, let your crew test the actual equipment by strapping into it and connecting to an anchor. There's no substitute for feeling what it's like to be suspended and seeing firsthand what needs to be inspected before each use.

Hands-on training can be offered either on or off the work site. On-site courses apply professional training for specific daily work activities. By training in and around the workers' normal environment, you can ensure that the issues discussed are immediately applicable to your employees. On the other hand, courses at an off-site facility provide controlled environments uniquely designed to offer practical experience. Some fall protection equipment manufacturers, including Capital Safety, offer both types of hands-on training and can conduct a session that is most applicable to the needs of your workers and your job sites.

CREATE A COMPREHENSIVE FALL PROTECTION PLAN

The purpose of a written fall protection plan is not to simply summarize basic compliance information. It must also serve as a resource for employees by offering best practices and tips to follow while working at height. Make sure it's customized for your job site, kept up to date, and easily accessible for your workers. Here are some areas your comprehensive plan should address:

- Specific fall prevention measures being implemented
- Ongoing responsibilities associated with inspection
- Rescue plan
- Solution for record keeping, maintenance, equipment replacement, incident reporting, enforcement, accident investigation and training

The rescue plan is a critical component of the overall fall protection plan. Rescue and evacuation from the upper reaches of the turbine tower can be almost impossible from the ground by conventional methods. In your rescue plan, be sure to outline the common hazards that occur during wind turbine construction and maintenance, such as fire or complete mechanical shutdown. Then address the on-site rescue team training, rescue operation methods and evacuation equipment.

A well-rounded fall protection plan not only tells your workers that you value their health and well being, but can also be the key to a safer job site.

INSPECT EQUIPMENT

Inspection and maintenance are often overlooked aspects of fall protection, but ensuring that equipment is regularly checked and approved for use is critical to worker safety. Everyday wear and tear, such as harness fraying or rusting, can take a toll on safety equipment even when it is not involved in a fall. Regular inspection ensures that the equipment each worker receives

complies with all applicable safety standards and regulations.

It is also important to keep timely and accurate records of all equipment inspections. This process is made easier with the use of RFID reader systems, which simplify and automate much of the process.

In the high-risk industry of wind turbine construction and maintenance, safety considerations are of paramount importance. When it comes to fall protection, there is no margin for error. Providing at-height workers with ample knowledge, reliable equipment and proper training is a life-saving step you can't afford to skip.